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FEBRUARY, 1913

The Agricultural Student

A
MONTHLY
MAGAZINE

DEVOTED TO
AGRICULTURAL EDUCATION



15c PER COPY

\$1.00 PER YEAR

There are Three Important Reasons Why Cows Should be Clipped:=====

- (1st) Their Health Will be Improved
- (2nd) Yield of Milk Will be Increased
- (3rd) Sanitary Conditions Will be Bettered

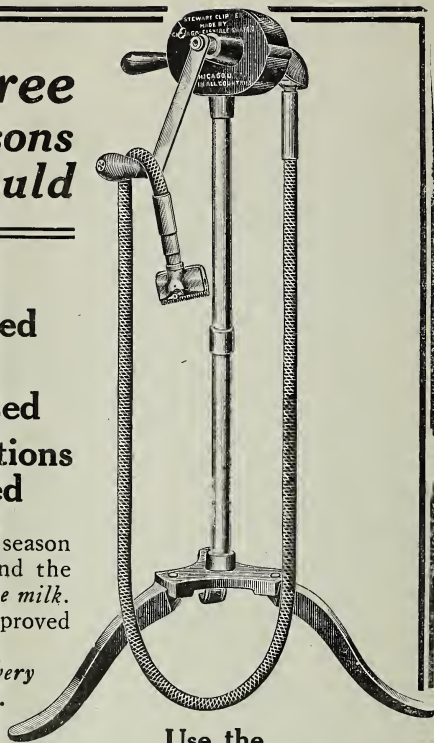
Clip off the long coat twice a season—in the spring and summer—and the cows *keep healthier and yield more milk*. Thousands of dairy farmers have proved this.

Clip the udders and flanks *every month*; it takes only a few minutes.

This makes it easy to keep the parts clean, thereby insuring clean, uncontaminated milk.

Results like these make clipping *profitable as well as sanitary*.

Minimize the expense, time and labor by clipping with a Stewart Machine. Anybody can operate it because it turns easy and fast, without hard work, trouble or danger to the animals.



Use the

STEWART ^{Ball-Bearing} Cow Clipping Machine

The sturdy construction of the Stewart insures a lifetime of good service. Gears are file hard, cut from the solid steel bar and are encased in an oil bath away from dust and dirt. Friction and wear are practically done away with. The clipper plates are specially hardened, tempered and ground to a fine cutting edge that stay sharp long and always cut keen.

Six feet of flexible shaft, and everything necessary to begin clipping with, is included with the machine. No extras at all and the machine as it comes is right for clipping horses, cows or mules.

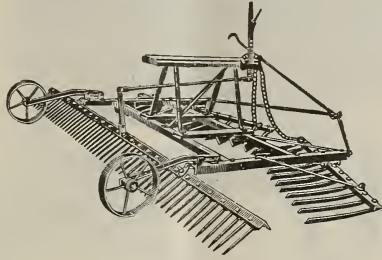
The Stewart Clipping Machine is sold for \$7.50 by dealers everywhere, or direct. Ask for our catalog describing our complete line of machines for clipping cows, horses, mules, and for shearing sheep.

Chicago Flexible Shaft Co.

La Salle Avenue

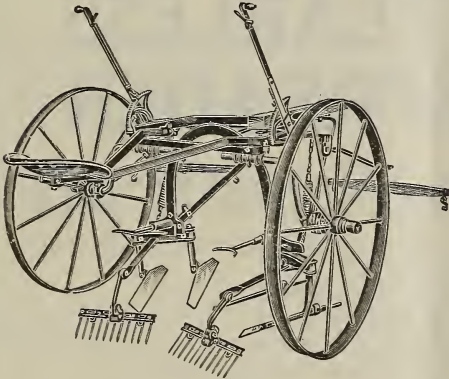
Chicago

The TOWER Pulverizer



Kills more weeds once over than three times with the best harrow ever invented. The United States Department of Agriculture, after a series of tests covering a period of six years, has discovered that weeds are the greatest enemies corn has to contend with.

The Tower Surface Cultivator



cuts the entire surface
of the soil, the same as
a hoe, so that not a
weed escapes.

This cultivator enabled Ivan Houser, a boy of Farmer City, Illinois, to raise the boys' prize acre of corn, 122.6 bushels, and an average of 117 bushels for 7 acres.

Also Chester Yarnell, a 17-year-old boy of St. James, Minn., to win his prize over 1,300 competitors with 102 bushels and 58 pounds.

Write us for their statements as to how they did it.

Be sure your new cultivator has TOWER on the tongue.

The J. D. Tower & Sons Co.

MENDOTA, ILLINOIS.



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OVER TWICE ITS OWN WIDTH.**

There is only one manure spreader which can spread an 8-foot strip from a 3-foot wagon body because the

WALTER A. WOOD **FEARLESS MANURE SPREADER**

is the only one with a **Circular Beater**. Yet the Fearless tracks with an ordinary wagon.

The Fearless lays the manure as thick on the edges as in the center of the strip.

The Fearless shortens the time of spreading and gets the best possible results from any manure. It spreads along fence rows, up against trees, and in out of way places other spreaders cannot reach.

Now is the time for you to study this machine and see how different it is from all other spreaders in results it secures.

Send for Special Spreader Catalog and go into the details of construction and principles involved.

Ask for our General Catalog which contains the big line of Walter A. Wood Farm Implements—the wonderfully efficient Admiral Mower, harrows, cultivators, drills, harvesters, engines, etc. You ought to study the Wood Line.

Write Us Now.

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You are now training your minds to think and your hands to do better and bigger things. Couple your scientific training with our practical knowledge and your success is assured. To be successful you must know how to do a thing and then have the proper means to accomplish what you believe and know.

Oliver Plows have made good with the farmers because they are made good at the factory.

OLIVER CHILLED PLOW WORKS

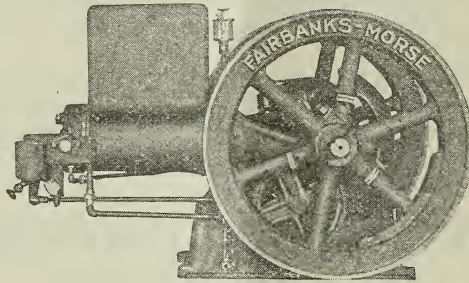
General Offices at South Bend, Indiana.

Works at South Bend, Ind., and Hamilton, Ont., Canada.

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Successful management of your own or some other man's farm means that you hold production costs to the lowest possible point. The farm engine, as you know, is a big factor in making every edge cut.

Your choice of an engine, however, should be made with care. Above all, keep efficiency in mind when you make your selection. You want an engine that will operate cheaply; one that is dependable. An engine that delays your work is a costly investment.



JACK OF ALL TRADES KEROSENE ENGINES

Will give sure, dependable service and will do your work at the lowest cost. These engines

Operate on Kerosene. They use about the same amount of kerosene per horse power hour as other engines do of gasoline. They enable you to **cut fuel expense** often as much as **50 per cent.**

They last for years. They are made of the best materials and every engine will **develop more than rated power.** They do not break down or go to pieces when worked hard.

The price is low. The large number we build and our modern factory facilities enables us to sell these high grade engines at remarkably low prices.

Every engine absolutely guaranteed.

Two, 4, 6 H. P. Horizontals, also other types and sizes up to 200 H.P.

Write for Catalog No. 1890F2.

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Cultivation keeps down weeds and loosens up the soil so that air and moisture can get down to the roots and add to the producing power of the vine or tree.

How to cultivate cheaply and well is the problem solved by the

Toehold Tractor

The horse's toe is Nature's most efficient tool for gripping the earth. The drive wheel of the ToeHold Tractor duplicates the horse's toe. This tractor gets its pull without weight. It grips the soil.

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It is good for plowing and hauling, it is light, simple, short-turning, and will go anywhere in an orchard or vineyard.

This is a new thing in orchard cultivation and a new thing in tractors. We'll tell you more about it if you'll write us.



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Power-Farming Machinery

LA PORTE, IND.

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By bringing to bear upon your live stock consignments the best efforts of a selling organization developed and perfected by twenty-six years of constant study and effort.

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Further, it makes no difference whether you are a small or a large feeder, experienced or inexperienced, we do our very best for you just the same—and that means that no one can do more or better.

*Therefore, to insure utmost Security,
Satisfaction and Profit, you should*

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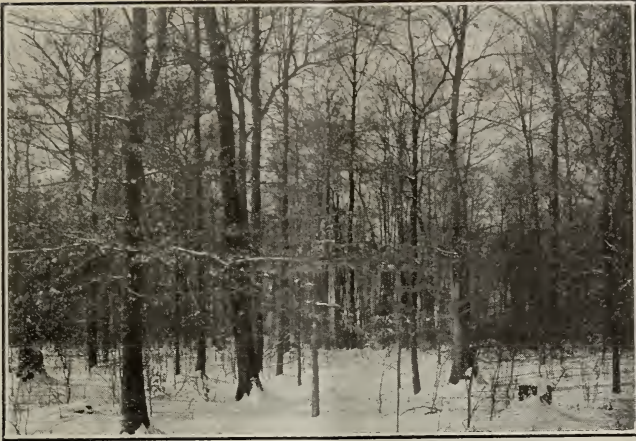
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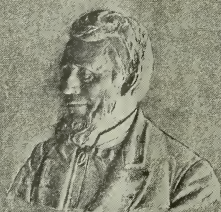
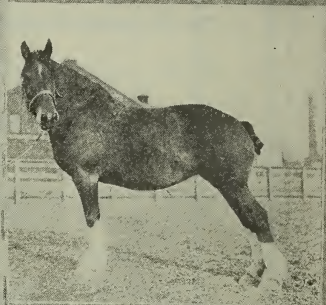
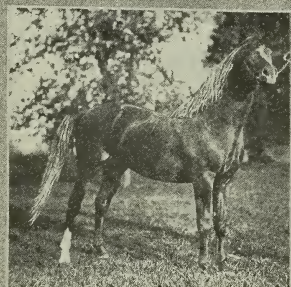
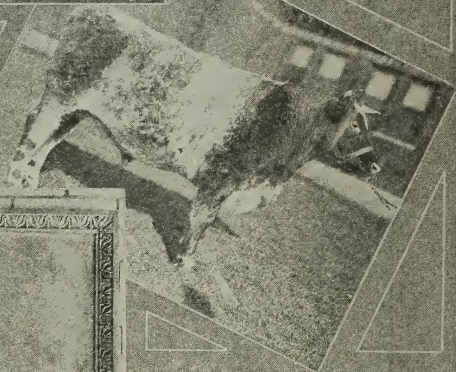
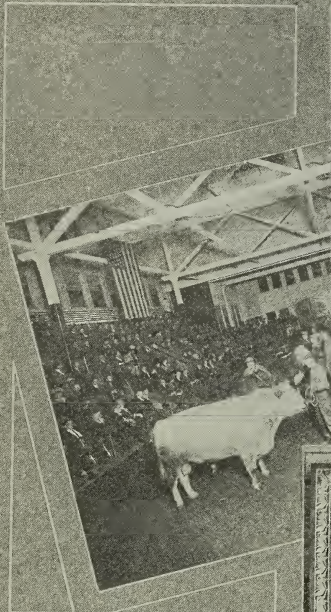
So. St. Joseph
So. St. Paul



Contents

	Page
FRONTISPIECE—College of Agriculture: Points of Interest.....	424
BOYS' AND GIRLS' CONTESTS AND CLUBS IN THE SUNFLOWER STATE—	
C. D. Steiner, '12, Supervisor of Boys' and Girls' Agricultural Clubs of Kansas	425
MINNESOTA AGRICULTURE AND SCHOOLS—	
Arthur C. Brookley, '12, Director of Agricultural High School, Adrian, Minn.	427
A CENTURY OLD FARM—	
T. L. Wheeler, Extension Department	430
HOG CHOLERA IMMUNE SERUM AND ITS PREPARATION—	
Dr. Paul Fischer, State Veterinarian	432
CONCRETE MANURE PITS	436
STACK ENSILAGE—	
Perry Van Ewing, Kansas Agricultural College.....	439
MAKING THE BOY CROP PAY—	
James Morrison, College of Agriculture, Ohio State University.....	442
EDITORIAL	444-445
DEPARTMENTS	446-453
NEWS NOTES	454-456

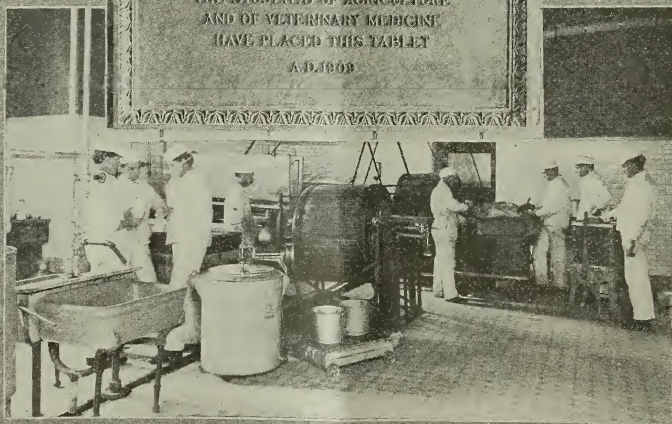
COLLEGE OF AGRICULTURE



TO THE MEMORY OF
NORTON STRANGE TOWNSHEND
1815 - 1895

BELIEVED PHYSICIAN, FRIEND OF THE
CAUSE OF HUMAN FREEDOM, WISE LAWMAKER,
A PIONEER IN AGRICULTURAL EDUCATION,
ONE OF THE FOUNDERS OF THIS UNIVERSITY
AND ITS FIRST PROFESSOR OF AGRICULTURE,
THE STUDENTS OF AGRICULTURE
AND OF VETERINARY MEDICINE
HAVE PLACED THIS TABLET

A.D. 1909



THE AGRICULTURAL STUDENT

Vol. XIX. OHIO STATE UNIVERSITY, COLUMBUS, FEBRUARY, 1913 *Number 6*

Boys' and Girl's Contests and Clubs in the Sunflower State

C. D. STEINER, '12

Supervisor of Boys' and Girls' Agricultural Clubs of Kansas.

BOYS' and girls' contests and clubs seem to have met with favor in Kansas. Boys' corn contests were first started in 1906, when about a thousand were enrolled. In 1906 other contests, such as potatoes, tomatoes, family garden, bread baking, canning and sewing were added, so that a larger opportunity in this form of work might be offered, not only for the boys but for the girls as well. Since then the enrollment in contest and club work for each year has been from 2,000 to 5,000 boys and girls.

The contest and club work that is now offered is, as it has been in the past, largely promoted and supervised by persons in the locality where the work is being done. All the agricultural college hopes to do is to offer suggestions and perhaps have some one to visit the local contestants or club. The agencies that the college seeks to enlist are county superintendents of schools, high school principals, public school teachers, Y. M. C. A. secretaries, commercial and neighborhood improvement clubs, farmers' institutes and clubs, granges and other organizations of a similar nature.

In some sparsely settled districts it seems almost impossible to get enough boys and girls interested in a certain line of work to form a permanent organization. In such cases they are

merely enrolled in contest work. This will require that they do all the work connected with their kind of contest that they are capable of doing and display their products, if possible, at "Contest Round-Up Day" and perhaps at the local or county farmers' institute.

Better results are gotten when three or more contestants form a more or less permanent organization by electing officers, adopting a constitution or by-laws, and choosing a leader for the club. For most of the club's lessons for a year's work have been prepared and these are usually sent free.

No club organizations are recognized unless a competent leader is chosen. Such a person should be at least 21 years of age. There is no special requirement along educational lines for such a position; what is needed is a person who has a zeal for doing things and has an intelligent comprehension of what should be done and how to do it successfully.

For the season of 1913 the following kinds of contests and clubs are being pushed: Corn, kafir, milo maize, broom corn, potato, tomato, family gardens, flower gardens, pig, poultry, civic improvement, bread and butter making, canning, sewing, and manual training. A kind of club that seems to be meeting the ideal requirements of a club for

country boys and girls is one that has been called Rural Life, a brief description of which follows:

The membership is confined to boys and girls between the ages of twelve and twenty-one years. Boys and girls from 12 to 18 years form one club, while those from 18 years up are in a separate club.

All members must be engaged in some form of improvement or contest work, approved by the supervisor of the boys' and girls' clubs of Kansas State

5. Contest in judging the farm crop, stock and home economics.

Special meetings are held for social hours or for any special work in which the club is interested. These clubs may take up any of the lines of contest work offered by the college. The central idea is to allow members to follow out the lines of work they are most interested in and to furnish means for satisfying their social desires.

In order to bring to a head all contest work of the boys and girls, a day of the



PREPARING FOR A CORN GROWING CONTEST.

Agricultural College, or must own and care for, according to the latest scientific methods, some animal or animals, whose final value is at least ten dollars.

There are regular meetings of the club once a month, at each of which a part or all of the following program is carried out:

1. Talks and discussions of agricultural and home economics subjects.
2. Nature studies.
3. Literary contests, spelling matches, etc.
4. Games and athletic contests.

school year has been set apart for the display of the products of their efforts. This is known as "Contest Round-Up Day" and is to be observed each year on the second Friday of November. The results last November were such as to convince the most skeptical of the merits of such a day in our public schools. It is one of the big days of the school year—a day when fathers and mothers and friends come to school, renew their friendship with each other, strengthen that with the teacher and learn what their children are doing in agriculture and home economics.

This contest work is also carried on at the local, county and state farmers' institutes, the winners of the local institutes contesting at the county, and the county at the state. The state institute is held each year during the holidays at the Kansas State Agricultural College and as high as 484 boys and girls have been in attendance. This visit of the boys and girls at the college seems to make a great impression

on them, for a large per cent. of the number that have attended during the past years have been or are enrolled at present in the Agricultural College.

These contests and clubs for country boys and girls mean that thousands of them will have their lives quickened by the touch of science, by the discovery of hidden powers, and by higher ideals. Through them, farm life will be dignified anew and become a rationalized business as it should be.

Minnesota Agriculture and Schools

ARTHUR C. BROOKLEY, '12

Director of Agricultural High School, Adrian, Minnesota

MINNESOTA is a state of opportunities. It occupies a central position on the American continent. It covers a distance of 405 miles from north to south, and 344 miles from east to west, and contains an area of 84,286 square miles or 51,749,120 acres, of which 3,508,119 acres are taken up by ten thousand picturesque lakes which have made the state famous for its fishing and hunting and for its summer resorts. There are 156,137 farms in the state, containing an average of 177 acres per farm, aggregating 27,675,828 acres in all. The total average of farm land actually cultivated in Minnesota is 19,609,000 acres. There are approximately 1,500,000 acres of government land in the state of Minnesota now open for homestead entries. On January 1, 1912, there were 2,322,551 acres of unsold state land. It is estimated that there are fifteen million acres of wild land in Minnesota in hands of railroad corporations, private corporations and individuals which can be purchased at low prices and on easy terms.

A study of the soils of Minnesota is

very interesting and reveals an arrangement of types that is very complex.

Minnesota is gradually changing from a wheat raising state into one of diversified farming.

In general it may be said that three types of farming prevail: (1) Grain farming in the western and northwestern parts of the state; (2) diversified farming in southern Minnesota, and (3) special crop farming in the territory contiguous to the large cities and in areas favoring special production.

All farm crops adapted to the northern states are easily and safely grown. The state ranks first in wheat and barley production and about third in oats and rye. The amount of all farm products for the year 1911, according to the Commissioner of Immigration, total \$500,000,000. The yield per acre is relatively high, corn in 1909 yielding an average of 34.8 bushels of shelled corn per acre. This was more than the yield of Iowa, Michigan, South Dakota or Wisconsin for the same year.

In 1911 there were 225,000 acres in the state planted to potatoes. The aver-

age yield was 45 bushels. The production was 25,875,000 bushels, representing a farm value of \$15,007,500.

The people of Minnesota are just learning the necessity of increasing live stock production and diversified farming as a means of maintaining their soil fertility and increasing their general prosperity. The live stock owned in Minnesota is increasing so rapidly that it will be but a few years until the state ranks first among the live stock producing commonwealths. The 1912 census figures show that there are owned in Minnesota 806,000 horses; 1,107,000 cattle, 600,000 sheep; 1,702,000 swine, while the poultry value was around \$27,000,000.

Then there are about 1,200,000 dairy cows, yielding an average of 3,700 lbs. of milk, 142 lbs. butter fat, per cow, making a gross net return in butter alone of \$42,500,000.

Today we have 825 creameries and 60 cheese factories. Minnesota is unquestionably the banner butter state of the Union. This product stands without a peer in quality, and has won many prizes for the highest average score in the National Creamery Butter-makers' Contest, open to the world.

When it comes to Horticulture, the state has proved to have an ideal soil and climate, together with splendid market facilities for the production of fruit.

People are just beginning to realize the state's possibilities in this line. Minnesota is the home of the Wealthy Apple and many other fruits have originated and are being grown extensively here.

The Public Schools.

Minnesota has a comprehensive system of rural, high, graded and normal schools operated under a department of

the public schools, Minnesota already has a permanent fund of \$22,000,000. The income from this fund is distributed annually to the public schools on the basis of the number of pupils enrolled in the state government which insures free and adequate education to all the people.

As a permanent means of support for rolled and attending not less than forty days. Besides this there is a state one-mill tax levy which, together with the income from the permanent school fund, constitutes the current school fund.

For the years 1912 and 1913 the special appropriations for public schools, in addition to local taxes levied in each district and the amount from the current school fund, are as follows:

Aid to High Schools.....	\$320,700
Aid to schools maintaining	
Agricultural Depts.	210,000
Aid to schools maintaining	
Industrial Training.....	125,000
Aid to graded schools.....	133,000
Aid to semi-graded schools.	160,958
Aid to rural schools.....	910,617
Aid to consolidated rural	
schools	100,000
Aid to common schools in un-	
organized territory	100,000
Aid to public school libraries	35,000
	<hr/>
	\$2,095,875

Agricultural education is unusually well provided for by agricultural colleges, experiment stations, schools for agriculture, agricultural instruction in high schools and industrial work in rural schools.

The seekers after higher education will find every opportunity at the State University, which ranks second in size and equipment among the colleges of the United States.

The state of Minnesota is doing a

wonderful work in developing her Agricultural High Schools and in developing agricultural departments in the State High Schools. In the high schools all over the state you find nature study and agriculture being taught, thus being a part of every High School curriculum. While in the winter you find short courses being given by about one-half of these same schools.

This short course commences on the first Monday in December and continues for 12 weeks of each year, the following courses being given: Agriculture, Manual Training, Domestic Art, Farm Accounts, Farm Law, English and Arithmetic.

The object of this is to enable young men and women to attend school during the winter months, and to put them in touch with best methods of farming and home making. As the short course sessions open at 10 A. M. and close at 3 P. M., every farmer boy can find time to do chores in the morning and return in time for chores in the evening.

In the Adrian High School in our present short course we have 25 farmer boys enrolled. Chaps who are eager to improve the home farm and surroundings attend.

While the educational problems both along agricultural and literary lines are not as yet completely solved in the city,

it is equally true that the problems of the country school in Minnesota have scarcely been touched. More consolidation of schools is what we need in this state and it will surely come in time.

Farmers know that a great amount of money is invested in the country system of education. Others feel that the country children are not getting fair attention, and still others believe the system so poor that they send their children to town at private expense, worry and trouble. Among these latter we find most of our well-to-do and thinking farmers. More of such men would give a strong, consolidated system of schools, where children would be taken in comfortable wagons, without exposure to rain or snow, and without undue care or worry to the parents.

It is true that Minnesota has a great many splendid city schools, but the country schools of this state are the ones we must or need worry about. That is why we do not want more schools, but better schools; not more teachers, but sympathetic, competent teachers; not half training, but a full development of mind, soul and body in schools that are equipped to teach accurately, quickly and interestingly the things a child needs in order to become a successful, patriotic citizen, whether upon the farm or in the legislative halls.



A Century Old Farm

T. L. WHEELER
Extension Department

“THIS farm has been in our family for over a hundred years.” We were standing on the top of a hill overlooking a farmstead, surrounded by graceful evergreens to which the speaker, Professor H. C. Price, Dean of the College of Agriculture, proudly called our attention. We had come out to see how a college professor farms, and had climbed the hill to get a good

him of the fatherland back in Wales, for here he established a home that has endured for a century. It was rough hillside, but undaunted by hardships and inspired with hope of the future, this staunch Welch pioneer subdued the land that today the great-grandson farms with so much pride.

It is no ordinary heritage, this century old farm. Orchards of apple and



IN THE DISTANCE STRETCHED

view of the place. The scene that met our eyes was inspiring. In the distance, as far as eye could see, stretched the undulating Welsh Hills of Licking County. Autumn had just laid her hand upon the countryside and the trees were brilliant with color. Far up the valley a little Welsh church reared its spire and here and there could be seen thrifty looking farm homes. Here, over a hundred years ago, thrilled by the beauty of these same hills, had stood the great-grandfather of the man by our side. No doubt, the scene reminded

peach trees stretch in long rows over the hills, sleek, well cared for Jersey and Red Polled cows graze in the blue-grass pastures, and in the valley grow bountiful crops of corn and wheat and clover. Order and good management are apparent everywhere about the place. The farmstead, built in 1845, has been remodeled into a comfortable, modern farm home. The barns and other buildings are neatly painted, and there is a silo and a manure shed and all the other appurtenances of the up-to-date farm.

The herd of dairy cows numbers upward of twenty-five head. They are of the best breeding, several having their names listed in the advanced registry, an indication of superior excellence. The records show that on an average the Jerseys produce 6,800 pounds of milk per cow per year, and the Red Polled, 7,000 pounds. The milk is sold and delivered in the city of Newark at 17 cents per gallon wholesale.

On this farm one sees good orchard management. There are no neglected

sod. The grass is mowed and left on the ground. Manure is applied every other year. The trees are planted thirty feet apart in the row and the rows twenty feet apart, making seventy trees to the acre. The varieties are alternated, so that when the trees begin to crowd, very other row can be cut out and still leave thirty-five trees to the acre. All but four of the thirty-five acres now in orchard are planted to fall and winter varieties, including Jonathan, Rome Beauty, Grimes' Gold-



THE UNDULATING WELSH HILLS.

and broken-down trees half hidden in weeds and brush. As much attention is given to the care of the orchard as to the other farm crops. The trees are pruned and sprayed and mulched, and they respond with an annual harvest of fine fruit. This past season ten acres produced over 1,000 bushels of apples. Eight-year-old Jonathan apple trees averaged five bushels per tree, and Gano trees of the same age averaged seven bushels.

Much of the land is too rough for cultivation, so the orchards are kept in

en. Gano, Stark, and Winesap.

That bane of all orchardists, the San Jose scale, has not made its appearance here, but the trees are sprayed three times each season with dilute lime-sulphur and arsenate of lead to control the codling moth and the apple scab. And once each year the tree trunks are rid of borers. The appearance of the trees bespeak their careful attention. They are vigorous-looking, and low headed to facilitate the gathering of the fruit. They indicate the supervision of the trained horticulturist.

Professor Price shares honor with Mr. D. W. Keller, his tenant, in the success of his farm. Working together on a partnership basis, they are making the ancient hillsides respond in a way they have never done before. They are proving that cows and apples are a good

combination, both for the land and the pocketbook; that good management and the application of scientific methods of farming mean an increased income; and that hill land that has been farmed for a hundred years can still be operated at a profit.

Hog Cholera Immune Serum and Its Preparation

DR. PAUL FISCHER
State Veterinarian

HOG cholera immune serum was first prepared, in an experimental way, by Dr. Marion Dorset, of the Bureau of Animal Industry of the United States Department of Agriculture.

In 1908 a number of states undertook the preparation of this serum with a view of developing practical methods for its production on a large scale and its systematic use as a means for the control and eradication of hog cholera. The losses occasioned by this disease in the United States were estimated by Dr. D. E. Salmon, formerly Chief of the National Bureau of Animal Industry, to have exceeded \$45,000,000 in one year. In Ohio the losses have frequently approached and possibly exceeded \$3,000,000.00 annually, or from 10 to 15 per cent of the total value of the swine in the state. These conditions were recognized by the Ohio State Board of Agriculture and, when the discovery of an effective preventive for hog cholera was announced, immediate steps were taken to confirm this discovery and thereafter to establish a suitable plant for the preparation of a reliable product in quantities that would make the serum available to all at a reasonable price.

The importance of undertaking this work by the state will be evident when it is understood that the preparation of

reliable serum is an expensive process and if prepared in a commercial way the price asked for the same would be more or less prohibitive, except for high class, registered stock. In connection with its high cost there would be inducement to the unscrupulous to place upon the market an inferior or worthless product which we know from past experience would find a ready sale and thus bring hog cholera immune serum into disrepute even before it could be given a fair trial. As a matter of fact, recent developments have already borne out our fears in this respect. Commercial firms for the manufacture and sale (particularly sale) of hog cholera serum have sprung up like mushrooms in the night and are reaping their harvest at the expense of credulous owners of cholera infected herds.

In May, 1908, with less than \$1000 at its disposal for experimental work, the Ohio State Board of Agriculture (Board of Live Stock Commissioners) erected a small laboratory, 10x16 feet floor space, and a few pig pens on a small tract of land that was donated for the purpose. A moderate equipment was installed and the preparation of serum begun. By November 1st five hundred head of swine on farms in Southwestern Ohio had been treated with Ohio state

serum. The results were practically perfect.

In 1909 the legislature, then in session, recognized the value of this work and appropriated \$3000.00 for its continuance and further development. In that year our plant was enlarged and 5,000 head of swine were given protective treatment with serum prepared in the state laboratory. In 1910 15,000 head of swine were treated. in 1911 50,000, and in 1912—to date—nearly 100,000 head of swine were protected for the farmers of Ohio with serum made in the laboratories of the State Board of Live Stock Commissioners.

This work has been so uniformly successful that the control of hog cholera seems now to be only a question of time and necessary funds to equip a suitable plant for the preparation of serum, and its systematic application in connection with the enforcement of proper quarantine measures. To this end the state has already appropriated \$85,000 for the erection and equipment of a state serum institute. A farm of 100 acres has been purchased and buildings are practically completed.

Immunity.

The artificial production of immunity to disease developed from the observation that recovery from an infectious disease protected the individual from a second attack of the same disease, and from the discovery by Dr. Jenner that recovery from an attack of cow pox (a mild form of small pox, so to speak) produced immunity to the severer forms of the disease. That was the beginning of the practice of vaccination (Latin, vacca, a cow).

Recovery from hog cholera protects, for a long period, against a second attack. Whether the first attack was comparatively mild or very severe, the immunity is the same.

For a long time the artificial production of immunity consisted of the production of a mild form of disease by inoculating the animal to be protected with an attenuated culture of the specific disease organism. After the animal recovered, which was usually the case, immunity would be established. Thus it has been possible to successfully "vaccinate" for anthrax, blackleg, rabies and a number of other infectious diseases of man and animals.

Serum treatment is a method of producing immunity that had its origin with the discovery that immunity following recovery from an infectious disease was due to the presence of **anti bodies** in the blood of the immune animal. This was first practically demonstrated by the discovery of serum treatment for diphtheria in children by Dr. Paul Ehrlich.

When an animal recovers from an infectious disease it does so by virtue of the fact that certain substances, known as **anti bodies**, are formed in its tissues, particularly in the blood, which have a destructive action on the germs which cause that particular disease and on their injurious products. These **anti bodies** may be artificially increased in the blood of an immune animal by repeated infection of such animal with cultures of the germs causing the original disease. The serum (liquid portion of the blood) prepared from the blood of such animals contains these antibodies in large numbers. Animals furnishing such serum are called hyper-immunes (over-immunes).

It has been found, further, that serum containing hog cholera anti bodies, injected into the circulation of a naturally susceptible pig, will protect such pig against infection with cholera just as effectively as recovery from a real at-

tack of the disease. The only difference being that immunity thus produced is of short duration, ceasing as soon as the anti bodies are destroyed in the blood (die of old age) or are excreted like any other foreign substance in the blood. A pig thus immunized does not have the power to replace the anti bodies that are excreted while the tissues of a pig that had an actual attack of disease have the power to indefinitely replace these anti bodies.

Immunity resulting from an actual attack of disease is called active immunity and is permanent. Immunity following artificial injection of serum containing anti bodies (immune serum) is called passive immunity and is temporary. Both forms of immunity are acquired as distinguished from natural immunity, explained below.

While hog cholera is a specific disease of swine, all swine are not equally susceptible to infection. Some individuals take the infection readily, develop the disease in a severe form and die rapidly. Others require a longer time after infection before they develop symptoms of disease even when inoculated with the same strain of virus (germs) they develop a mild form of disease and ultimately make a complete recovery. Between these we have all degrees of intermediate stages and occasionally we find an animal that is naturally immune. Such individuals are said to possess natural immunity. Human beings, cows and horses as a class cannot be infected with hog cholera—they possess a specific immunity to smallpox, etc.

Passive immunity may be made active and thus permanent by subjecting the passively immune animal to infection—either by natural exposure to the disease by mingling with sick animals after the injection of immune serum or

by the injection of disease producing virus simultaneously with the immune serum. In either case the animal resists infection when subsequently exposed to disease.

Serum immune treatment is the production of acquired immunity, either active or passive, by means of serum from hyperimmune animals.

Twenty cubic centimeters of immune serum injected into the tissues of a pig weighing 50 pounds will protect against cholera infection for a period of 3 to 6 weeks. If a pig thus treated is exposed to infection before immunity expires immunity becomes permanent. The same result may be accomplished artificially by injecting, simultaneously with the serum, about 2 cubic centimeters of blood serum from a cholera sick pig (virus). The former is called the serum alone or single treatment; the latter the serum simultaneous or double treatment.

Duration of immunity following the double treatment. This varies with the age of the pig at the time of treatment, but is always longer than immunity following treatment with serum alone. In suckling pigs—if treated at any time within six weeks from the day of birth—the immunity lasts about 3 or 4 months, although individual pigs show variations in this respect. Shoats treated after weaning usually retain their immunity for 6 or 8 months, and mature animals about one year. As a general rule, the older the animal at time of treatment, other things being equal, the more permanent the immunity.

For practical purposes, on farms, all suckling pigs should be treated before they are six weeks old. At 4 months, they should receive a second treatment, which will usually protect them until they are ready for market. Mature

breeding stock should be treated once a year. The offspring from immune sows is usually more or less immune for a few weeks after birth, thus giving an opportunity to wait until all litters are farrowed before applying treatment.

The serum is prepared in our laboratories by competent men under conditions over which we have absolute control. After it is prepared it is tested out to determine its power to prevent the disease in the infected animal. When the strength of the virus is determined, a double dose is given. This large margin of safety is deemed necessary on account of the difference in susceptibility observed in some pigs, certain individuals requiring twice the amount of serum necessary for the protection of others.

This precaution no doubt accounts, in part at least, for the uniformly successful results that have been obtained from the field use of Ohio State serum.

The fact that over one hundred and fifty thousand head of swine have been treated by the serum simultaneous method with material from the laboratories of the Ohio State Board of Live Stock Commissioners and that in all cases when healthy herds were treated the results were practically perfect, speaks for itself.

Serum treatment for hog cholera may be used on healthy herds as a preventive or it may be used in herds in which the disease has already made its appearance to check its progress.

Serum simultaneous treatment of healthy herds is practically a positive preventive for hog cholera.

Serum alone treatment in infected herds effectively checks the progress of disease by protecting the healthy animals, checking the disease in those animals that have been infected less than

6 or 7 days, but having little effect on visibly sick animals. In such herds, healthy animals should be given serum simultaneous treatment, healthy appearing animals with fever as indicated by the clinical thermometer should receive large doses of serum alone and visibly affected animals should be left untreated.

The actual cost of the preparation is charged to the owner of the swine, the services of the veterinarian being gratis. The cost of treatment varies with the size of the pig or the amount of material administered. The charges average 15 cents for suckling pigs, 30 cents for 50-lb. shots and from 50 cents to \$1.50 for larger swine.

For practical purposes it is recommended that all suckling pigs be treated within six weeks after farrowing. If the sows have been immunized, the offspring is usually immune for this period of time, thus giving an opportunity for waiting until all or most pigs have been farrowed. Pigs treated at that age remain immune for about 3 or 4 months. At the end of that time they should be fair sized shoats, ready for second treatment. The second treatment costs about 30 cents and will protect until the pigs are ready for market. Thus 45 cents insures protection against cholera during the ordinary lifetime of a pig. Mature breeding stock should be protected every year. This would cost about \$1.50 per head. Systematically and intelligently applied, this method will keep premises free from cholera and, if generally practiced, together with the enforcement of proper quarantine and shipping regulations to prevent introduction of disease, hog cholera can be kept in complete control and, it is not too much to hope, ultimately exterminated.

Concrete Manure Pits

EVERY farmer knows the great value of barnyard manure as compared with other fertilizers and he also knows, or should know, that a vast deal of it is wasted when piled in the open or stored in sheds or pens. The purpose of this brief article is to tell him how to preserve its full value at minimum cost.

When left in the open, manure deteriorates in fertilizing properties and is washed away by rain.

Stored in sheds or pens, heating or "firing" takes place through lack of moisture. The remedy for these con-

ditions has come with the advent of the concrete manure pit. The sectional drawing (Fig. 1) shows the type of construction. These pits are especially convenient when manure is hauled to the fields frequently. They should be constructed as follows:

The walls and floor are 5 inches thick. The clear dimensions of the pit are: Depth, 3 feet; width, 6 feet; length, 12 feet. Dig the trench 3 feet 5 inches by 6 feet 10 inches by 12 inches 10 inches. By keeping the sides vertical only an inside form will be needed. Frame the sides and ends separately. For the sides cut the 1-inch siding 12 feet long and nail it to four 2 by 4 inch uprights

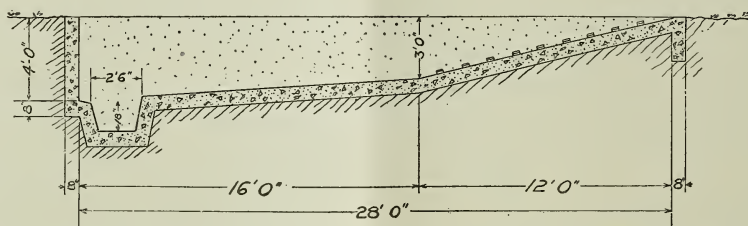


FIG. 1.—SECTIONAL DRAWING OF SHALLOW CONCRETE MANURE PIT.

ditions has come with the advent of the concrete manure pit.

The concrete pit, when properly made, is waterproof, thus insuring the proper degree of moisture and also the preservation of liquid manure that formerly ran to waste.

Will a concrete pit pay?

The answer is that from 30 to 40 per cent of the strength of manure is wasted under the extravagant practices described above. Government experts have estimated that one load of manure stored in a concrete pit is worth from $1\frac{1}{2}$ to 2 loads of manure cared for in the ordinary way. This is a large percentage in favor of the concrete pit.

In a majority of cases farmers will probably find the shallow manure pit the most convenient and practical. The

3 feet long and equally spaced. The end uprights for the sides are 2 by 4 inches nailed flat to the siding; the others are also 2 by 4, but are nailed on edge. It is not necessary to cut these uprights to exact lengths; they may be allowed to extend above the siding. Make the siding for the end sections of the form 5 feet 2 inches long and at the ends nail it to the edge of two 2 by 4 inch uprights. Place a single 2 by 4 upright between each end pair. Cut four cross braces, 5 to 10 inches long, from 2 to 4 inch timbers. Have enough sections of woven-wire fencing, $7\frac{1}{2}$ feet long, to cover the bottom of the pit.

The concrete should be a mixture consisting of 1 bag of Portland cement to 4 cubic feet of pit gravel or 1 bag of Portland cement, 2 cubic feet of sand

and 4 cubic feet of crushed stone. Cross-wise tamp in a section of concrete (not too wet) 2 inches thick and a little wider than the strip of woven-wire fencing used as reinforcing. Lay the wire with an even division of the extra length, so that it may project upward into the side walls. Tamp in the remaining 3 inches of concrete. Work rapidly and complete the floor. No facing mortar is needed.

Immediately set up the forms on the

make a poor wall. If the top of the earthen wall tends to crumble, hold it back with 1-inch boards braced against the forms. To keep out flood water, the pit may be extended 6 inches above the ground by using the lower half of a 1-foot board to hold back the dirt, by allowing the remainder to project above the ground level, and by adding 6 inches to the height of the inside form. Remove the forms after the concrete has set four days by first drawing the

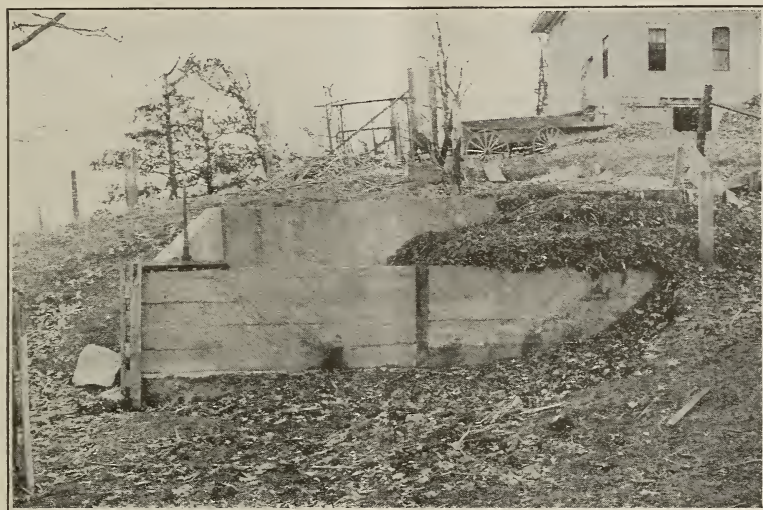


FIG. 2.—LARGE TYPE OF CONCRETE MANURE PIT. PUMP SHOWS AT LEFT HAND SIDE OF PIT.

finished floor so as to allow a 5-inch wall on all sides. Join them by nailing together the 2 by 4's at the corners of the sides and ends. Do not drive the nails home. Cross-brace with 2 by 4's and with 1-inch boards from each central end upright to the second side upright.

Quickly begin filling the forms with concrete almost wet enough to pour, and keep it practically the same height on all sides. Puddle the concrete by running a long paddle up and down next to the form. Do not punch the earthen wall. Dirt in the concrete may

nails in the corner 2 by 4's. The pit may be used after 10 days.

Manure Basins.

Where manure must be stored for a considerable length of time, larger pits or basins are required. Such pits are seldom made over 5 feet deep (in the clear at the deeper end) and are wide enough that the manure may be loaded on a spreader in the pit and drawn up a roughened concrete incline or run. The slope for such a run must not be steeper than 1 foot up to 4 feet out.

In building such a basin as planned in Fig. 2, use a team with a plow and

scraper to make an earthen pit in which to build a concrete basin of the clear dimensions shown. In laying out the earthen pit, bear in mind that the concrete walls and floor are 8 inches thick and make due allowance for the same. With a spade trim the sides and the deep end vertical.

In order to form a sump hole from which the liquid manure can be pumped, in one corner at the deep end of the pit dig a hole 18 inches deep by $2\frac{1}{2}$ feet in diameter. To protect the concrete floor, at the upper end of the driveway excavate a trench 8 inches wide and 2 inches deep for a concrete foundation apron. Extend it around the corners and slope it upward to meet the driveway incline.

In general, the framing of the forms is similar to that of shallow pits. If the earthen walls stand firm, only an inside form will be needed. Otherwise, build an outer form. For the forms use 1-inch siding on 2 by 4 inch studding spaced 2 feet 8 inches. These uprights need not be cut to exact lengths. Save lumber by allowing them to extend above the siding. Stiffen each section of the form by nailing a 2 by 4 inch scantling to the uprights at top and bottom of the forms.

Erect the forms in the pit. Set them

on 8-inch concrete blocks or bricks, so that the floor may be built under them. To prevent bulging, cross-brace the forms with 2 by 4 inch timbers. Begin filling with concrete, as for shallow manure pits, and do not stop until the job is completed.

Lay the floor for the bottom and the incline the same as for shallow pits. To give teams a sure footing on the incline, embed in the concrete the turned-up ends of iron cleats bent at right angles, similar to a capital U. Old wagon tires, cut in lengths not greater than 20 inches and turned up 4 inches at each end, will do. Leave 1 inch clearance between the cleats and the concrete, and set them so as not to obstruct the wheelway. Space the cleats 14 to 16 inches. Roughen or corrugate the bottom crosswise every 6 inches by using a 5-foot length of 2 by 4 inch scantling beveled lengthwise to the shape of a carpenter's chisel. To make the corrugations, set the timber with the beveled face toward the incline. Strike the 2 by 4 with a heavy hammer, so as to indent the concrete to the depth of an inch.

If a shed roof is required, insert in the top of the concrete walls while still soft, several $\frac{1}{2}$ -inch bolts, which should project about $2\frac{1}{2}$ inches above the wall, to which the roof timbering or cover may be fastened.

Stack Ensilage

PERRY VAN EWING
Kansas Agricultural College

IN this part of the world comparative-ly few people understand the significance of the term, "stack ensilage." Still fewer really appreciate the values and possibilities of this method of producing forage, or realize its value for practically revolutionizing the agriculture for the future of the dry-farming belt, where crop failures are common.

The silo was first extensively used by the French. Their silos consisted generally of a pit or a hole in the ground either lined or unlined, into which the green forage was placed to ferment. Later, the more progressive came along and gradually extended the form and position of the silo until it was entirely above the ground. It was made, generally, of some lasting material, such as wood, stone, plaster, cement, tile, or other building material to give an airtight enclosure. Next, still more progressive farmers came along with the very proper idea that the cost of silo erection was considerable, so they proceeded to recommend and practice the making of stack ensilage. This consists essentially of stacking the forage while green. By applying pressure and a little attention, it will automatically seal itself and produce ensilage the equal of any tub-ensilage, which is the term applied to ensilage made in the ordinary method.

The practice of making ensilage by this method is common in some parts of the world, yet it has never gained any foothold to speak of in this country. In Australia and New Zealand it has become quite a common practice, and even in England and some of the other European countries it is by no

means unknown, yet in the United States it has been experimented with but very little. A Mr. Aiken, a cattle feeder at Zeandale, Kansas, has tried out the idea with very gratifying results, indeed, and does not intend to discontinue the practice. This method has also been tried out on the farm of the late Mr. David Rankin, one of the few men who made millions at farming, at Tarkio, Missouri, with the result that they continue to put up more and more silage by this method each year.

Probably the chief advantage of this method of making silage is the lack of necessity for an expensive silo, because if one had a silo, in a proper location, nothing would be gained by making stack ensilage. In the second place, the stack can be placed in any field or paddock wherever it is the most convenient from the field and also to where the stock are to be fed; and, further, anything can be used for silage that can be grown—from Russian thistles to green wheat, oats, barley, or corn. In Australia and New Zealand the native sub-tropical, luxuriant grasses are used extensively for stack ensilage.

To insure success in making stack ensilage, the essential required is sufficient quantity to develop heat, and also to avoid the great waste that occurs on the small surfaces of small stacks—that is to say, by making the stack higher and thicker the proportion of loss is smaller. The stack should be built on a level site and nearly square, and the ordinary method of building reversed—the sides should be two feet higher than the center, with the slightest lean inwards, and

then well firmed. The idea is that the sides press out to a level with the center when weight is applied.

The least quantity that can profitably be preserved by stack ensilage usually is estimated at 25 tons. This should be set out to cover a space about fifteen feet in diameter. For from fifty to sixty tons, a space of about twenty-five by twenty feet would be required. A derrick or hoist for lifting material to the stack is necessary, and it is decidedly conducive to economy. Cutting and stacking may be carried on in all weathers. In the building of a stack a first layer of from six to eight feet should be carted so as to insure the requisite heat, say 130 deg. F. It will then be sufficient to add a layer of about three feet each day. In order to properly regulate the temperature, it is necessary to place a galvanized iron pipe in the center, so that the thermometer can be inserted. It must not be forgotten that the whole art of ensilage making is in the control of the heat by pressure properly applied. The best ensilage is made by delaying the maximum temperature until the temperature has risen between 120 and 150 deg. There are two kinds of ensilage produced in a stack, viz: green and brown. For green ensilage the temperature required is from 125 to 140 deg. F.; for brown ensilage, the temperature may be allowed to rise to 160 deg. Should a greater heat be attained the silage would be of little value. If the temperature does not reach 120 deg., the product would be what is known as sour ensilage, which, though wholesome, is not usually considered as satisfactory as sweet ensilage, especially when intended for milk cows.

The completed stack should be topped by a platform of rough timber, provid-

ed with a ledge 20 in. deep around the edges. This should then be filled with earth lifted by the hoist from a trench around the stack. Other weighty material can be used, of course, but earth is generally preferable. On the Rankin farm, where corn was put up in this manner, they applied their pressure by means of beams across the stacks with block and tackle to the ground on each end.

Silage thus prepared will be greatly improved by the addition of salt in the proportion of one and one-half pounds to each ton of the green material. When the ensilage is required for use, sufficient boards may be removed to allow space for the hay knife, and the remainder of the roof should be left undisturbed, although a small amount of rain will not affect it.

Ensilage put up in this way costs to make only one-fourth more than hay. There is, in return, the compensation that the ensilage maker is independent of the weather, as either rain or lack of rain cannot spoil it. So far as waste is concerned, if properly done or put up, there is no waste whatever. The spoiled ensilage on the outside of the stack rarely extends inward over a foot, and frequently only four or five inches, depending on the crop and the method in which the forage was stacked. The most of this ensilage that is termed spoiled is simply sour ensilage, or that which has not been heated to a temperature above 120 deg., and, while it is not the best, the stock will eat it. In the instance where Mr. Rankin stacked the green fodder, there was no loss from spoiled ensilage on the outside, for all this material was cleaned up by the sheep.

Thus we see that it is entirely possible for stack ensilage to answer up in

all the requirements for tub ensilage, and at a much less initial cost. There is practically no more loss than occurs in the case of tub ensilage, and, furthermore, the stacks can be made of most any form of roughage and can be placed wherever is the most convenient.

Authorities say that the salivation of the dry-farming area of the West lies in silo construction and the feeding of live stock. They continually preach, put up silos, and do not once stop to think whether or not there might be a better

and cheaper method. It is exactly the cost of the silo that prevents the majority of farmers from obtaining silos. This method obviates the necessity of this initial cost and it is possible that the stack ensilage system will have a great effect on the agriculture of the afore-mentioned district. Of course, it would be expected that in good years a surplus of ensilage would be stacked for adverse years, as ensilage put up in this manner will keep for several years.



A world of shining hints of hues
Wherein all tints so gently fuse,
In loveliness of light and shade,
No eye may tell whereof is made
Such pearly radiance, nor invade
The violet depth thereof for clues
To clasp its color—keys and know
The subtle secrets of the snow.

—Evelyn Stein.

Making the Boy Crop Pay

JAMES MORRISON

College of Agriculture, Ohio State University

“WHAT is your orchard’s greatest pest?” was the query propounded to a number of middle western orchard owners, and when one woman answered, “Boys,” the quip was hailed as pertinent and witty by papers in all sections of the country.

Is the boy on the farm a “pest,” and if so, how can his troublesomeness be done away with? If the reader will only cast his memory back over two or three decades, will he not find that the boy came by his tendencies as a matter of natural inheritance? The boy problem is one in which inheritance plays at least an equal part with environment. The utmost care must be exerted in the development of only those inherited tendencies which will make for a broader and better manhood.

This is pre-eminently an age of scientific advancement. We have applied science and experience—possibly the two are synonymous—to nearly every line of human activity in recent years. Let us consider the science of farming, for we are more vitally interested in this than in the others. We find revealed a vast scope. We have seen the necessity of eliminating certain and conserving certain other qualities in soils, in crops—in fact, in all the phases of agriculture. May we not, then, consider the boy on the farm as one of the elements of a successful and permanent agriculture, and apply to his life the same scientific attention we give to our other, and inferior, crops.

The normal boy, if such a creation is possible, passes it seems through three states of development—the animal stage, the savage stage and the man. The first two are but transitional, and

if properly directed, will lead to a third stage of the most perfect order. In the first stage the boy is naturally destructive in nature, and must be taught the lessons of obedience to authority. From this into the savagery period, we are told by our modern philosophers, is but a brief step, a mere glancing into the doorway of life, yet here does the boy learn the lessons of real experience—the power of self-control, interdependence and reliability.

Here, then, is the period in which the boy must be reached if his “man stage” is to be one for his fellows to admire and pattern after.

First, the boy must be taught the dignity and beauty of the farm life. He is largely an idealist by nature, and if the charm of the creative instinct of animals and plants is called to his attention, he will not be tempted to heed the call of the city, which has drawn heavily upon the man crop of the farm in recent years. Scientific study is a part of the school curricula throughout our state, so we may remand the boy to the care of his school for this portion of his education.

“Work and plenty of it” is a requisite for the development of the hardy “man stage.” Teach the boy that his value, just as a tree, is gauged by its fruit or shade production, is measured by the results of his personal effort. Whether it be in his school life, in his chores on the farm or in his social affairs, he has powers which, if properly guided, cannot but lead to Success. The trouble with most of us is that we are not aware of our own strength; we don’t use half the personal powers that Nature has endowed us with.

The boy must have companionship. The companionship of work, briefly outlined above, will not alone develop a fruitful spirit. The companionship of books is an element that passes too soon—usually when the boy has finished the fiction and history on the home shelves and in the school library.

There is a greater companionship to which the boy should have recourse—the fellowship of his parents, and in this will all the powers of development be found concentrated. How many fathers are there, on or off the farm, who enter into the life of their boys? Can't be pestered? Don't be so wrapped up in yourselves and you will find that your boy is approaching rapidly the "man stage" you are soon to leave behind.

Talk to your boy about his work. Tell him all you can about its early history; the reasons for its present condition. Teach him as best you can the value of scientific study, not mere reading. Show him how the world is but a great experimental plot for his personality; how he

can secure or reject the best things of life by the influence of his own character. Don't be afraid to tell your boy of the battles you have fought and lost. They'll probably do more good than bragging over your victories; he'll at least have the benefit of your experience and will not have to suffer defeat. And, above all, teach him the fellowship of the Master, Creator of all that exists for his benefit.

In short, be a boy with your boy. Live over again your own youth, but refashion it as an example for him to follow, letting him understand that he is not being forced to do it, but is performing the highest duty he can to please "his best friend."

The boy is not too great a "pest" if properly handled. The biggest part of the mischief was done when he was born. Show him the way to live rightly, the dignity of the farm labors, and the beauty of the offerings of nature, and there will be little danger of his leaving the farm home.

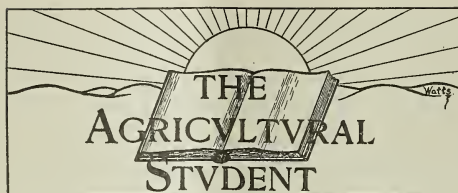
THE COUNTRY FAITH.

Here in the country's heart
Where the grass is green,
Life is the same sweet life
As it e'er hath been.

Trust in God still lives
And the bell at morn
Floats with a thought of God
O'er the rising corn.

God comes down in the rain
And the crop grows tall—
This is the country faith
And the best of all.

—Norman Gale.



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COLUMBUS, OHIO, FEBRUARY, 1913.

Editorial

The first "Farmers' Week" ever held at Ohio State University has passed into history. Viewed from **FARMERS' WEEK.** from every standpoint this form of agricultural activity demands the highest praise and deserves recognition as a permanent institution. Those in attendance from all sections of the state received much practical information and much by way of inspiration which will accompany them to their respective homes and give new strength and new courage to attack the problems of the farm.

No doubt, certain professors did have to work late at night to prepare extra charts, extra demonstration materials, and the like; perhaps others experienced inconveniences and even found it necessary to suspend certain lines of work for a time, but if these same professors could have heard the numerous expressions of approval, could have

seen the dawning light of a new intelligence and could have noted the changed mental attitude experienced by many of the visiting students, they would certainly have felt themselves well repaid and would immediately begin to look forward toward a bigger "Week" next year.

Probably at no previous time have agricultural affairs received so much attention at the **AGRICULTURAL LEGISLATION.** hands of legislators, high executives, and politicians. Whether this activity is in all cases actuated solely by a desire to benefit agricultural or whether it is in some instances being seized upon as a vehicle to consummate individual and personal desires remains, of course, to be seen.

State. The incoming administration seems intent upon "doing things."

Numerous bills, both proposed and enacted, are of much importance to the agricultural interests of the state, but will not be commented upon here. The proposed consolidation of the Agricultural College, the State Board of Agriculture, and the Experiment Station, however, carries with it such powers for good or for evil as to merit the closest scrutiny.

All will admit that some sort of central control could be of material value in co-ordinating the work of these three agricultural forces. However, the recent outcry against duplication of extension work by these three departments is unwarranted, since such work might readily be triplicated and still fall far short of the needs of the people. Certain economies could, of course, be effected by placing all this extension work under one department. Why not let the College of Agriculture carry on all forms of extension work just as it is now done in most of our leading states? The Experiment Station was originally constituted as an outgrowth of the College—a laboratory for testing out questions arising in the class room and on the farm. The Station should never have been separated from the College, but should have been placed on an equal basis therewith and kept under the same control, as is now done in most of our sister state. Finally, the State Board of Agriculture, being appointive in nature and requiring no prerequisite training which would necessarily stamp the incumbents as authorities on agricultural subjects, should confine its attentions to the business and legal phases of agricultural activities — conducting the state fair, inspecting orchards, nursery stock, etc.

If co-ordination under a central board of control means the drawing of these very proper division lines, then we say, "well and good." The present administration has before it the opportunity of building a greater and grander Ohio State University, and by so doing can confer upon the people far-reaching benefits of inestimable value. The Governor has expressed himself as desiring the upbuilding of a greater University structure. Let him take the first step in this direction by widening the field of usefulness of the Agricultural College through the encouragement of its Extension Department.

National. In Congress we have a fine example of two opposing forces working apparently toward the same end—the advancement of agriculture—and yet because of personal jealousies and ambitions preventing the adoption of either of the two measures which would accomplish that end. The Lever Bill, providing for liberal federal aid in promoting extension work, passed the House last year. A similar bill, very much broader in scope and appropriating thirty-five times as much money, passed the Senate under the name of the Page Bill. Senator Hoke Smith, of Georgia, has been using every effort to secure the passage of the Lever Bill in the Senate, but in the face of the strongest commendation from agricultural leaders over the entire United States, the Senate recently voted, 30 to 31, to amend the Page Bill to include the Lever Bill. This necessitates much additional committee work and jeopardizes the final passage of the bill. Compromise measures are now under way, however, which it is hoped will finally secure the desired legislation.

ALUMNI WHAT THE BUSY GRADS ARE DOING

Joseph F. Cox, '12, is an assistant in Agronomy at the Pennsylvania State College. **Alva H. Benton**, '12, is an instructor in the same institution.

Adelbert Agler, '12, is employed with the Union Bag and Paper Co. He resides at 1379 Fair Ave., Columbus, O.

J. M. Bell, '12, has charge of the Agricultural Department in the LeRoy High School, LeRoy, Ohio.

Otho H. Pollock, '12, who operates a farm near Delaware, Ohio, has been assisting in the Animal Husbandry Department of the University during the "Short Course."

Harry R. Obrien, '10, is instructor in English at the Oklahoma Agricultural and Mechanical College, located at Stillwater, Okla.

Eugene W. Mendenhall, '97, is connected with the Ohio Department of Agriculture. He is Nursery Orchard Inspector.

Frederick P. Mills, Ex. '04, is operating a creamery at Marysville, Ohio.

Ralph H. Peterson, enrolled in the Winter Course 1910, is managing a nursery farm near Piqua, Ohio.

Edwin H. Russell, Ex. '04, located at Springville, N. Y., is a cheese manufacturer.

Glenn G. Hayes, '12, was a recent visitor on the campus and informs us that he has resigned his position with "The Standard Farm Paper's" Chicago office in order to accept an excellent offer tendered him by "The Farm Press" of the same city.

Reed O. Brigham, '12, spent several

days between semesters in visiting former friends about the campus. Mr. Brigham has a fellowship in the Botany Department at the University of Illinois and is engaged in working out his master's degree.

E. W. Burkey, '11, who is farming at Ravenna, was visiting friends on the campus recently. Since graduating Mr. Burkey has purchased a farm near the one owned by his father.

Aaron E. Taylor, '12, is with the Ohio Experiment Station, Wooster, Ohio.

Opal I. Tillman, '06, has charge of the weed and seed investigations in the Department of Agriculture at Raleigh, N. C.

Otto E. Jennings, '03, is assistant curator of Botany, Carnegie Museum, and professor of Paleobotany at the University of Pittsburg. He resides at 241 Oakland Ave., Pittsburg, Pa.

J. H. Gourley, '08, is professor of Horticulture at the New Hampshire Agricultural College.

James G. Sanders, '03, is state entomologist and professor in charge of the Department of Economic Entomology at the Wisconsin College of Agriculture, Madison, Wis.

William F. Schlupp, '12, is connected with the U. S. Department of Agriculture. At present he is traveling field agent in the Bureau of Entomology.

Fred L. Myser, Ex. '12, who is now located at Tacoma, Wash., contemplates going to British Columbia or Alaska. **M. K. Smythe**, '12, is also located at Tacoma, Wash.

CURRENT AGRICULTURAL LITERATURE

COMMENTS AND CRITICISMS ON CONTEMPORARY CONTRIBUTIONS

The Scientific American for February 1st is mainly devoted to agricultural subjects and presents a very creditable appearance. One of the leading articles comes from the pen of Dean Homer C. Price and is entitled "Increasing the Food Supply of a Nation." It takes up a discussion of intensive farming methods as practiced in Germany. Numerous important facts are brought forth, the article is well illustrated, and withal is quite interesting.

The serial recently run in the Saturday Evening Post under the heading, "New Lives for Old," has caused considerable comment among those interested in "popular" agriculture. The narrative purports to be the story of a city dweller's adventures in farming and of the rejuvenation of the rural community in which he is located. The story is undoubtedly interesting, and contains much of truth, but it likewise contains much that is fiction and should be read with due allowance.

The book, "Broom Corn Culture," by Prof. A. G. McCall, of the Agronomy Department, has recently been published. It is a practical treatise of the culture of broom corn, covering such phases as seed, planting, soil, climatic conditions, marketing conditions and enemies of the crop. It also explains the various steps in the process of manufacturing brooms. The Orang-Judd Company, New York.

The Dairy Farmer Defined. Kimball's Dairy Farmer, January 1, 1913. This article arrives at certain conclusions in explaining the occupation of dairy farming. It cites the tiller of the soil on one hand and the milk peddler on the other as extremes of the occupation. A very clear statement of facts, interesting to those who do not have a clear conception of the business.

"The Young Farmer," some things he should know, is the title of a new book and Thomas F. Hunt is the author. Various chapters are devoted to such topics as: "Means of Acquiring Land," "Farm Organization," "Where to Locate," "Size of the Farm," "Returns from Farm Animals, etc." Tempered with prudence and wisdom, it should be invaluable to the younger generation.

The "Cost of Horse Feed," by Clyde A. Waugh. Ohio Farmer, January 11, 1913. The article presents statistics taken by the students in Animal Husbandry Nutrition at the Ohio State University. The figures were taken largely from places where many horses were cared for, such as those used by express companies, breweries, transfer companies and fire departments. Among other things of interest the statement was made that: "Generally speaking throughout the entire investigation, those horses given least care were owned by the concerns that paid out the largest amounts for feed."

ANSWERED BY EXPERTS

Questions addressed to Dept. D, Agricultural Student, will be turned over to the particular faculty member most capable of answering, and question and answer will be printed in succeeding number of "The Agricultural Student". Questions will be answered by mail if stamped envelope is enclosed.

Concerning Catalpas.

My father and I are very much interested in the growing of a catalpa grove and would appreciate any suggestions or literature that you could furnish us along this line. We are going to grow a portion of these trees for posts and as there are many different species of catalpa we would like to know which is the best to plant for that purpose.—W. U. P. Dayton, Ohio.

The Experiment Station at Wooster is the most likely source of literature on the subject of catalpa growing and it would be advisable to write them for such publications as they may have on the subject. We can however offer the following suggestions: First, if you are going to plant a large amount of ground to the catalpa it would be best for you to buy the seed and raise your own seedlings. The true hardy catalpa or the *Catalpa Speciosa* does best here in Ohio, and if you could get seed of some reliable grower and produce your own seedlings you could get a fine grove of trees. Second, we would advise you not to plant catalpa on very poor soil, for they will not do well. Many people get discouraged in the results, because they expect the catalpa to do well in almost any kind of soil. Some trees like the poplar can grow well in very poor soil, but the

catalpa requires rich soil. Third, when you get the seeds for planting, store them in a cool dry place until the time of planting which is the same time as corn planting time. Plant your seeds about $\frac{1}{2}$ to $\frac{3}{4}$ of an inch in depth in rows, the rows about 3 or 4 feet apart so that you can cultivate in between. The weeds must be kept out or the seedlings will be choked. They ought to grow from 1 to $1\frac{1}{2}$ foot in height the first year. They can be transplanted the second year and should be planted in their permanent location 6x6 or 8x8 to do well for fencing posts. While the trees are small, say the first two or three years the ground should be cultivated. The trees also need some care in the way of cutting or rubbing of the buds so as to create a main stem straight and large in diameter. During the winter it would be a good idea to place some light mulch between the rows to keep the ground loose and moist.

If these suggestions are followed you should be able to harvest good-sized fence-posts from seeds in 6 to 7 years after planting. You should get at least 1200 trees or that many fence posts from one acre, which at 30 cents apiece, would make \$360 for one acre, or a little over \$50.00 per acre per year.

WITH THE BREEDER

NOTES OF INTEREST AMONG THE FLOCKS AND HERDS

Shephard & Osburn, of Lockbourne, Ohio, held their fourth public auction of Poland China brood sows on Jan. 30, 1913. This was a fine opportunity for Poland China fanciers, as fifty head of high-class, registered sows were offered.

The seven highest dairy production records in the world are as follows: (1) Benastine Belle, 1057 lbs. of butter fat in 1 year, (2) Pontiac Clothilde De Kol II., 1017 lbs.; (3) Highlawn Hartog De Kol, 998.4 lbs.; (4) Colantha 4th Johanna, 998 lbs.; (5) Daisy Grace De Kol, 962 lbs.; (6) Spottswood Daisy Pearl, 957 lbs., and (7) Jacoba Irene, 952 lbs. The first five of these cows are Holsteins, the sixth is a Guernsey and the seventh a Jersey. Cows numbered (1), (3), (5) and (6) are owned in Ohio, a fact of which every "Buckeye" should be proud. Benastine Belle, Highlawn Hartog De Kol and Daisy Grace De Kol, owned by Dan Dimmick, East Claridon, O., constitute the greatest herd known to history, the average production of these three cows being 1007 lbs of butter fat in one year. Among other important records held in Ohio is that of the champion two-year-old Ayrshire, White Lilly, owned by John Sherwin, of Wil-

Joughby, O. Her record is 12,023 lbs. of milk in one year.

A new record recently made in Massachusetts, by the Holstein cow Creanelle Vale, showed a production of 29,591 lbs. of milk and 924 lbs. of fat in one year.

Among the recent additions made to the University herd is a white bull calf of the Shorthorn breed. He was purchased by the Animal Husbandry Department from Mr. C. W. McIntyre, of Troy, Ohio, who is the possessor of many fine animals belonging to this breed. This calf is an excellent representative of the Shorthorn breed and his ancestors were all high class animals.

A new phase of incubation will be inaugurated by Prof. F. S. Jacoby this spring. Community Hatching is the name applied to this project, which is a new work in this state. Any farmer or other person interested in poultry work can send his eggs to the University and they will be hatched. The only consideration attached to this offer is that the Poultry Department be allowed to keep twenty per cent. of the hatched chicks. All labor, oil and other items of expense will be borne by the department.

Secondary Agriculture

Devoted to the Interests of Agricultural Education in High and Common Schools

Requests have been received for suitable subjects to be studied in the schools at this season of the year. We offer the following and suggest that they will make good topics to discuss at Boys' Club meetings and various other gatherings where boys and girls and even older people are interested. Select the ones that are best suited to your locality, then study the subject so you can apply it to the local conditions in such a way that you can interest the children.

The teacher must present these subjects each in his own way. You have no precedent to follow, so do not be afraid of being original—try out any method you think will be good.

When possible, work these topics in with the regular class work. The Arithmetic class offers splendid opportunity for problems in farm bookkeeping. There is much material on these various subjects that offers excellent material for the Reading class, and you can always use the subjects in Language work. Then, too, the Geography class may be made more interesting by a study of the agricultural products of different states.

When our teachers combine the fundamentals of education with the everyday problems of the children and link the two together as they should be, then, and then only, will our schools fulfill their mission of really educating the child. This does not apply to Agriculture alone, but the same idea should

be carried out with all occupations that vitally concerns the child.

1. Judging corn.
2. Elements of forestry.
3. The horse and its care.
4. The cow.
5. Milk and butter.
6. Sheep, hogs, poultry, etc.
7. Feeding and care of farm animals.
8. Comparative studies of Agricultural products of various states.
9. Crop records and farm bookkeeping.
10. Roads, rural mail, parcel post, etc.
11. Farm machinery, fences, buildings, etc.
12. Birds, economic feeding, etc.

CONSOLIDATION OF COUNTRY SCHOOLS.

It was Goldsmith who said, "Ill fares the land, to hastening ills a prey, Where wealth accumulates and men decay."

Fittingly, it seems to me, in the discussion of the country school problem, this little verse has been changed to read:

"Ill fares the land to hastening ills a prey,
Where corn accumulates and boys decay."

Or:
"Ill fares the land, to hastening ills a prey,
Where hogs and cows accumulate, but boys and girls decay."

Many of our country communities, because of the condition of their schools, must plead guilty to the accusation, which this bit of verse deals out to them. In many instances, farming communities have occupied themselves completely with things material. To grow larger crops of grain, to produce more and better live stock, to erect barns and outbuildings of modern day design, which will most efficiently store this grain and house this live stock—

ondary consideration. In such places, conditions make efficient school work impossible and the chances of preparation for effective life service go glimmering.

But it is an old saying, that "the darkest hour always precedes the dawn," and never was it more truly said than in the case of the country school. Country schools are passing through a revolutionary stage. Rural districts are awakening to the crying



"CONSERVING THE RURAL RESOURCES."

John Swaney Consolidated High School, McNabb, Illinois.

these have been problems requiring nearly all of their attention and, day after day, they have ridden past their little, poorly-equipped school building, which houses the children of the district, who are attempting to do efficient work under an inefficient teacher and never once have they squandered a thought concerning the welfare of their boys and girls. Such, in brief, in many cases, is the story of that community life where the children of the neighborhood have been made a sec-

needs of country children. A call to arms has been sounded and farmers, who have ever done anything but mark time, have gone on and are waging an effective warfare. True it is, that these farmers still love the record crop, that makes for heaping bins and bulging mows; they still like to look upon their pens of fattening hogs and cattle. But, their vision is widening and they are coming to realize that they must give some time and thought to another interest much more vital, namely, their

boys and girls. The days of the little country school house are numbered. The age of Consolidation of Country Schools is begun.

A pioneer among consolidated schools in the State of Illinois is the John Swaney Consolidated School, located near McNabb, in Putnam County. This school is the result of an organized community interest among the people of three school districts. It is the outgrowth of the conditions which surrounded the old time country schools in these communities. In this instance, consolidation has answered the needs of the people admirably. It has met the problem of insufficient school equipment and inefficient teaching force; it has brought about a larger school and social life for country children and multiplied their opportunities. In short, the school is the center of a richer, more wholesome, community life than these people have ever known before.

The school provides training, which includes work in the eight elementary grades and a four-year course in High School. This High School is included in the accredited list of High Schools in the State and its graduates are prepared to enter the State University. The High School course of study, in addition to the work included in any regular High School course, makes provision for training in Agriculture. Five courses in Agronomy, two courses in Horticulture, and five courses in Animal Husbandry are given.

The work in Animal Husbandry has opportunity to flourish, because of the

location of the school. It is but a short way distant from flocks and herds, which give students a splendid chance to study all kinds of farm live stock. The latest proposed plan at this Consolidated School is to establish a school herd. This would be a new venture for High Schools in this country.

In attempting courses in Animal Husbandry, lack of suitable text books has been one difficulty, which all Secondary Schools have had to face. Up to the present time, practically nothing has been done in preparing such text books. A new book, just off the press, entitled, "Beginnings in Animal Husbandry," by Prof. C. S. Plumb, has been prepared especially for the use of Animal Husbandry students in Secondary Schools. It should answer admirably a crying need of Animal Husbandry students in High Schools and minor Colleges. It is well adapted to needs of short course students in our State Agricultural Colleges. It offers to the country boy, in schools like the John Swaney Consolidated, the opportunity of coming more fully into his own as regards all classes of live stock. One purpose of the consolidated country school is to minister unto the needs of the country masses. Surely, it is the business of such schools to give courses in Agriculture, if they are to get close to the life of the country boy. The location is ideal for such studies. Text books, especially prepared for students in these courses, will make this ministry of the country school much more effective.

Prof. Donald J. Kays.

The ploughing is whooping anon, anon!
 Small clouds are sailing,
 Blue sky prevailing;
 The winter is over and gone.

PROTECTING AND FEEDING THE BIRDS.

"February is likely to be the coldest month of the year," says Old Probabilities. Very well, then, fill up the coal cellar, put on the storm door, see that the furnace is in running order, see that the warmest coats and furs, robes and bed blankets are handy, stir up the fire, and let the blizzard come! For man is a thinking and reasoning animal. He remembers the winters that have come before and knows that he must provide again their rigors or he will be cold and hungry and miserable and perhaps may sicken and die. It has taken him thousands of years to learn how to provide the comforts that he now enjoys. He has gone into the well, the mine, the forest, and the water fall, and has made them all contribute to his comfort; he has made the sheep furnish him garments, the cow furnish him food, the horse do his work and bear his burdens, and the chickens and the swine have also helped to fill his storehouse.

In short, if he is to enjoy the benefits of their living, he must give them the benefit of his reason and his thought. What a fortunate arrangement! What a splendid system! It is a great bargain that robs no one.

But are these domestic animals and birds the only ones among all of God's creatures to whom we owe any debt or from whom we derive any benefit? Look about you and think again. True, you may find a few with whom there seems but little chance of establishing a contract, the rat and the English sparrow, for example. But, passing all such by, what about the hundreds of bird species, with their song, their plumage and the protection which they offer to our fields and pastures, our fruits, our flowers and even to our domestic animals themselves!

What of the skunk who spends his nights ridding our fields of harmful pests? What about the toad and the snake that make a business of policing our gardens? All these are our friends, struggling for a chance to live with us and begging for a chance to exchange services. The very least we can do to show our appreciation is to let them live and not begrudge them the room they occupy, the life they live, and the little grain or fruit they need to balance up a ration.

But can we not afford to do more than that? The musician would give thousands if he could duplicate perfectly the call of Bob White and the song of Bobolink. The artist would go into raptures if he could reproduce on his canvas the color effects of the blue jay and the oriole. The farmer would chuckle with satisfaction if he knew how many dollars the young quail were saving him by gathering the chinch bugs in his wheat field or how many field mice those skunks were killing in his meadow.

All right, then, let us think again; let us study the needs and comforts of these friends. Then let us pass laws for their further protection; let us give the skunk a place for his den; let us make the quail, the lark, the robin, the barn swallow, the bluebird and the bobolink feel at home, and if any of them are hungry and cold in the February blast let us take the time to feed them and furnish them protection. Then let us build bird houses and muzzle the cat and give them a real welcome.

Then we shall soon have grounds on which to hope and predict that the time will some day come when we shall know all of our fellow creatures better and there will be found none with whom we cannot afford to exchange courtesies.

W. R. Wheelock, '13.



February News Notes



"Practical Live Stock Feeding" was the subject of B. E. Carmichael's address given before the last meeting of the Saddle and Sirloin Club.

Definite plans have been adopted for the building of part of the proposed quadrangle group of dormitories for men. Ground will be broken in the spring for a building that will accommodate 200 men. The alumni will pay for the bonds sold to finance the proposition.

One part of the Winter Course that is being given special attention is the training of some fifty of the students who are interested in corn to become competent judges. The short time permitted makes the course treat of the most practical points. With all the shows that have been held this year and the possibility of more next year in connection with growing contests, the demand for good judges will be great.

Five senior horticultural students took part in the Ohio State Apple Show held at Zanesville, the week of Jan. 20, by giving short talks on subjects of interest to those that might attend the meetings. C. L. Long spoke on "Thinning Fruit," C. L. Clayton on "Inter-pollination," J. M. Rogers on the "Utilization of Orchard By-Products," K. J. Hopp on "Causes of Unfruitfulness," and Paul Logan on the subject of "Crown Gall." This practice of having senior students give talks at various meetings and shows over the state has proven highly successful in other states and will be continued.

Mr. John Cunningham, of Gambier, is the only farmer in the present state senate.

D. J. Kays, of the department of Animal Husbandry, was elected secretary-treasurer of the Ohio Percheron Breeders' Association at their annual meeting last month.

A county improvement association has been formed in Portage County, with H. P. Miller as agricultural expert. On condition that 3,000 members be secured to contribute \$10 a year for five years, D. R. Hanna has offered to give \$50,000 to this association for the purpose of developing pure bred live stock and good roads in the county. About 1,300 members have already joined.

Rural postal business is on the increase, which is a sign of activity among the farmers. Nine years ago the first of October a rural mail route leading out of Caldwell, O., was established. During the first month 950 pieces of mail were distributed. Nine years after, during the same month, 6,000 pieces of mail were distributed and the daily papers along the route had increased from one to seventy-five.

Following is a list of appropriations the trustees have asked the present legislature to give to the College of Agriculture for 1913: Additional farm lands and improvements, \$42,000; Horticultural laboratory, \$1,000; equipment for Agricultural College, \$17,000; Horticulture and Forestry building, \$75,000; Extension work, \$50,000.

Alumni secretaries of American universities meet on the campus Feb. 21 and 22. H. S. Warwick will represent Ohio State.

Gifford Pinchot was the principal speaker at the annual meeting of the Ohio State Forestry Society, held Jan. 15. Prof. W. R. Lazenby is president of the society.

Fred Nobs, a native of Switzerland and expert cheese-maker employed by a co-operative company in Stark county, has again been giving instruction in this line during the Winter Course.

Professors Oscar Erf and O. C. Cunningham have revised their Daily Laboratory Manual. It will replace the old edition. It has also been adopted by the Dairy Department of the Kentucky State University.

We regret to announce that Mr. T. L. Wheeler, who for nearly two years has held the position of Extension Editor, has resigned in order to accept a position as editor of The Farmers' Guide, of Huntington, Indiana, with which publication he was formerly identified. Mr. Wheeler has an excellent offer from the "Guide" and will take active charge after April 1st.

The Ohio Percheron Horse Breeders' Association held its first anniversary meeting in the Judging Pavilion at the Ohio State University, Jan. 15. It was an enthusiastic and well attended meeting, at which Dr. Carl W. Gay, of the University of Pennsylvania, was given an attentive hearing on the subject of "Percheron Type." Following Dr. Gay's address Prof. C. S. Plumb gave a series of lantern views relative to horse breeding.

Prof. F. S. Jacoby is to conduct a class in poultry raising at the City Y. M. C. A., beginning sometime this month.

After March 15 the instructors in the Extension Department will be available to the farmers of the state for council and demonstration work.

Prof. C. S. Plumb exhibited his collection of wools and wool fibers at the National Corn Exposition, held at Columbia, S. C., Jan. 27-Feb. 8.

Agricultural implements exported in 1912 equaled \$40,000,000, as against \$18,000,000 ten years ago. Russia receives one-fourth of these.

Recommendation was made at the meeting of the Ohio Cannery Association, January 9, to provide a larger sum of money to the Food Commissioner for the inspection of canneries.

OHIO STATE BOARD OF AGRICULTURE.

One of the most interesting and successful meetings in the history of the Ohio State Board of Agriculture was held in Columbus, January 14-16. The attendance was large and the discussion keen, at all sessions. January 14 was "Live Stock Rally Day," and the meetings on this day were mainly given over to the subjects of hog cholera and bovine tuberculosis. Differences of opinion regarding these subjects brought out valuable points. January 15 was taken up by the report of the recent Ohio Rural Life Survey. Gifford Pinchot, in his address on "The Country Church," said: "Every rural minister should be a farmer as well as a minister and have a 30 acre farm of his own." P. P. Claxton made a plea for

the consolidatin of rural schools, and urged the desirability of permanent positions for school teachers during good behavior. Other speakers were Prof. John Lee Coulter, Washington, D. C.; Herman N. Morse, of the Ohio Rural Life Survey; Prof. Paul L. Vogt, of Miami University, and Rev. Chas. Marston, Millersburg, O. Dr. Warren H. Wilson, of New York, presided.

Gov. Jas. M. Cox was the chief speaker on Ohio Farmers' Rally Day, January 16. He advocated central control for the college of agriculture, the state board of agriculture, and the experiment station. Resolutions were passed condemning homeseekers' rates by railroads as luring farmers from Ohio, recommending legislative appropriation to send exhibits showing Ohio's resources to places outside of the state and asking appointment by the governor of two men on the International Farm Credit Commission, and requesting the legislature to appropriate \$3000 to defray their expenses to Europe. The legislature was also asked to pass laws giving further protection against the importation of diseased live stock into the state.

Agricultural College statistics for the year 1912-13 are as follows: First year Agriculture 208, second year 124,

third year 84, fourth year 54. First year Domestic Science 102, second year 76, third year 42, fourth year 32. First year Forestry 30, second year 20, third year 13, fourth year 11. First year Horticulture 31, second year 15, third year 11, fourth year 3. First year Short Agriculture 94, second year 47. First year Short Horticulture 2, second year 2. Special Animal Husbandry Course 3. Specials in Agriiculture 25, in Domestic Science 6, in Forestry 1, in Horticulture 3. Winter Course students 215. Grand total, 1254.

The Rural Economics Department has found it expedient to establish what is known as a "Farmers' Exchange," in order to more efficiently care for their correspondence regarding inquiries for farm help, situations wanted, etc. The idea is to maintain a sort of employment agency so that those seeking employment and those seeking empolyees may be brought in touch with one another. A card index is kept of men who want work on farms or who want farms to rent. An index is also kept of the farms that are for rent. It is a new idea for an Agriculture College to take up work of this kind, but it will be a great convenience to the people of the state.



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Fellow Students, let us show our appreciation not only by giving these firms our trade, but by boosting them to our friends. A thousand students here in school ought to be a class that any firm would be glad to get their goods before. Look over this list of advertisers and do your business with them, at the same time mentioning your connection with "THE STUDENT."



SEASON 1912-1913.

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Prof. W. J. Rader's Academies of Dancing

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SOUTH HIGH ACADEMY,

199½ S. High St. Phones: Auto 3456; Bell 5877.

Will organize a beginners' class Wednesday evening, February 19th, 7:30 o'clock.

NEIL AVE. ACADEMY,

647 Neil Ave. Phones: Auto 4431; Bell 6189.

Will organize a beginners' class Friday evening, February 21st, 7:30 o'clock.

OAK ST. ACADEMY,

827 Oak St. Phones: Auto 4431; Bell 6189.

The Academy has been rearranged for functions of all sizes and is complete in every respect.

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Gentlemen, per term of 10 lessons.....	\$4 00
Ladies, per term of 10 lessons.....	3 00
Private lessons, \$1.00 per lesson; six lessons.....	5 00

Private lessons can be had afternoons or evenings.

Tuition can be paid \$1.00 per week until paid. The Waltz, Two-Step, Three-Step, Columbus Minuet and Rye Waltz taught in one term.

WINTER PAVILION—Located on Neil Ave., between Goodale St. and Poplar Ave. Open Friday and Saturday evenings. Operated on Summer plan.

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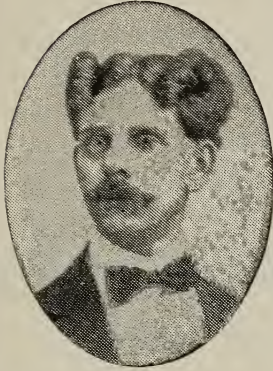
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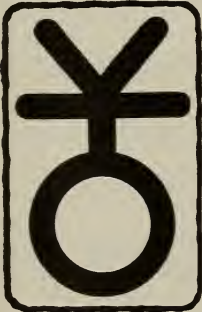
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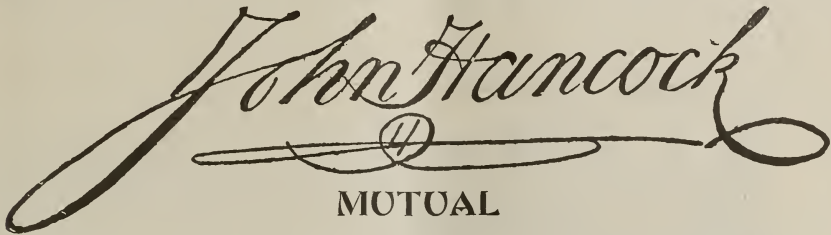
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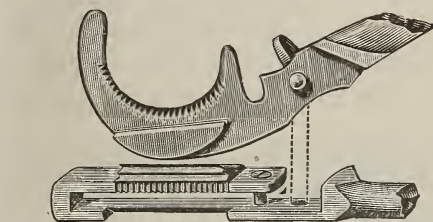
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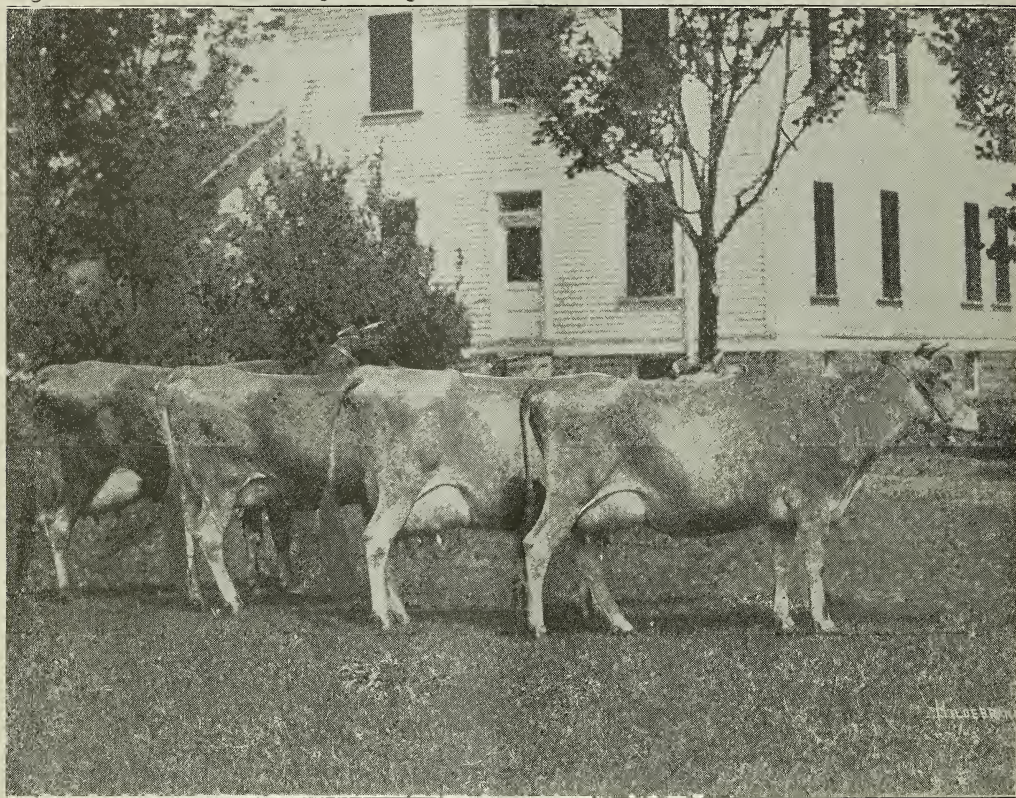
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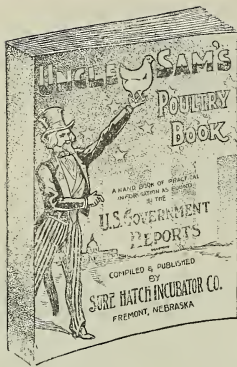


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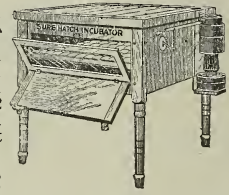




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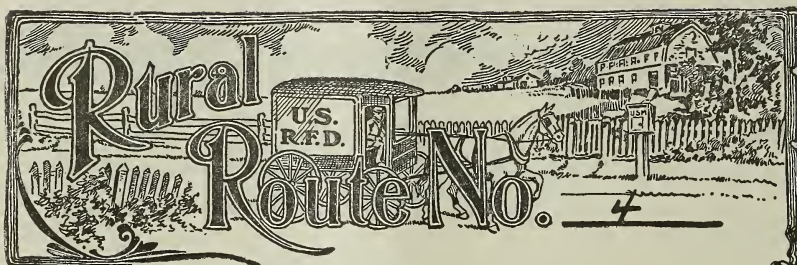
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(2)

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We finished husking yesterday. From the acre where we tried your theory about bone-meal and clover making the Potash available, we harvested 50 bushels of rather chaffy corn, and from the rest of the field, where we used bone, clover and 50 lbs. Muriate of Potash per acre, we husked out 70 bushels per acre of tip-top corn that is nearly all fit to sell on the ear for seed corn.

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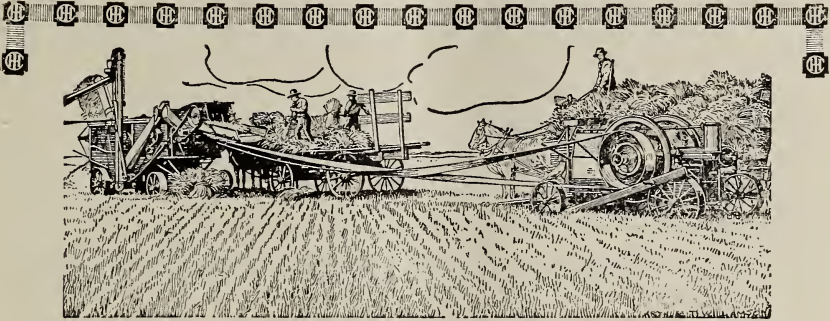
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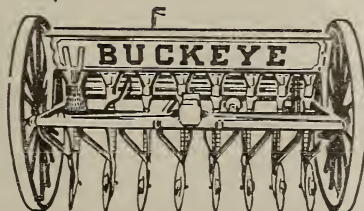
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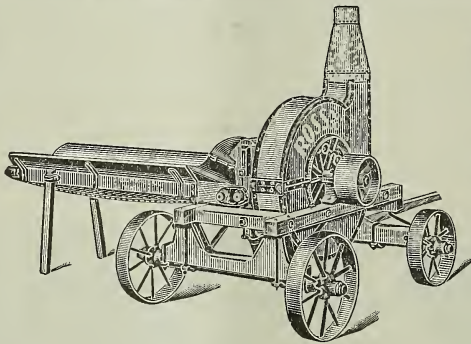
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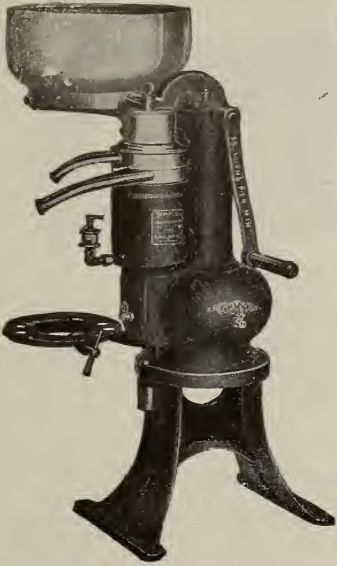
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Fig. 1345

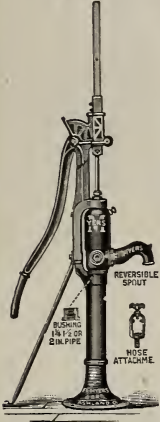


Fig. 1287



Fig. 1384



Fig. 1160



Fig. 333



Fig. 1138



Fig. 813

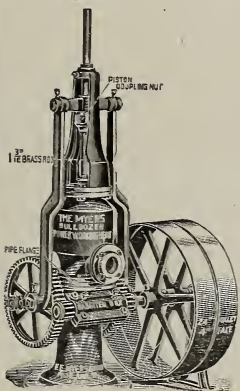
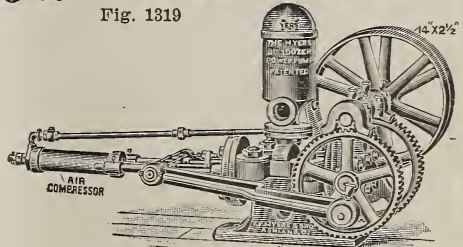


Fig. 1319



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